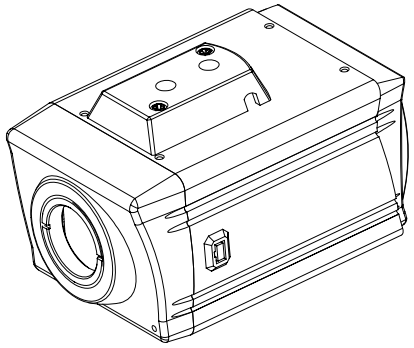
SERVICE MANUAL

1/2.8” SONY COLOR CMOS OSD CAMERA

2.0 Mega Pixel Full HD Series



The serial number of this product may be found on the bottom of the unit.
You should note the serial number of this unit in the space provided and retain this instruction as a permanent record of your purchase to aid identification in the event of theft.

Model No. _____

Serial No. _____

CAUTION

RISK OF ELECTRIC SHOCK
DO NOT OPEN

CAUTION:

TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK), NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

The lightning flash with arrowhead symbol, within an equilateral triangle, is interned to alert the user to the presence of uninsulated “dangerous voltage” within the product’s enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

▲ Before attempting to connect this product, please read and keep this manual for future use.

Safety Warning

1. Do not open the cover, it may cause electric shock. Ask a qualified service person for maintenance when you encounter any problems.
2. Install the camera away from TV, radio transmitter, magnet, electric motor, transformer, audio speakers because the magnetic fields generated from above devices will distort the video image.
3. Place the camera on a solid base. Install the camera away from stoves or other heat generating devices as the high temperature could cause deformation, discoloration or other damages to the camera. Install the camera at where the temperature range does not exceed -10°C to 50°C (14°F to 122°F)

4. Do not expose and operate the camera in the rain and humid areas.
5. Use only soft dry cloth to clean the camera. Also use lens tissue or cotton tipped applicator and ethanol to clean the CMOS sensor and camera lens.
6. When the camera is not in use, put the cover cap on the lens mount. Please do not touch the surface of CMOS sensor by bare hand.

Introduction

This Full HD series camera introduces a new level of high picture quality through the digital signal processing LSI's technology for advanced video surveillance. It provides the most reliable and accurate color picture in the security industry.

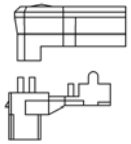
Main Features

- Color camera with full HD resolution SONY 1/2.8" 2.0 Mega Pixel Progressive Exmor CMOS image sensor.
- Resolution of 1920x1080p @ 30fps full high definition.
- Controlled by OSD (On Screen Display) menu in 4 languages.
- OLPF auto switching (IR-Cut Removable) for true day & night performance.
- ACCE: Adaptive Color & Contrast Enhancement (D-WDR).
- Smart Noise Reduction: 3D-NR + Motion Detection.
- Selectable 2X~30X SENS-UP for starlight picture.
- LSC: Lens Shading Compensation.
- DPC: Dead Pixel Compensation.

Parts Names & Components

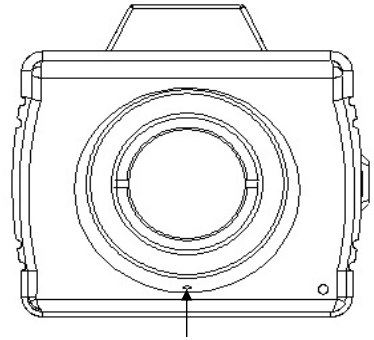
Hex Screwdriver

Auto Iris Plug



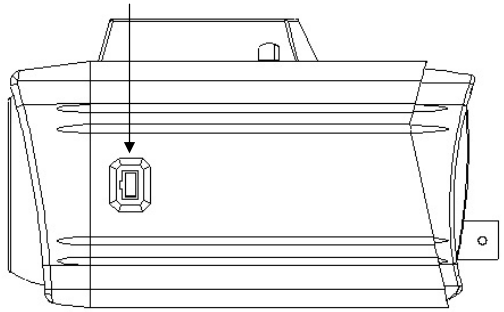
C-Mount Ring (Option)

Manual



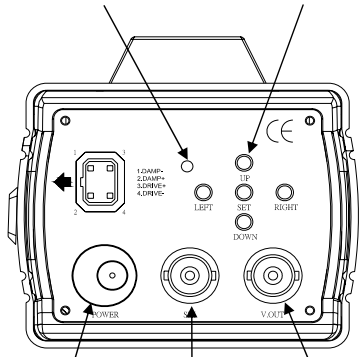
Hole to fix lens

Auto iris connector



Power LED

Selection & setting buttons



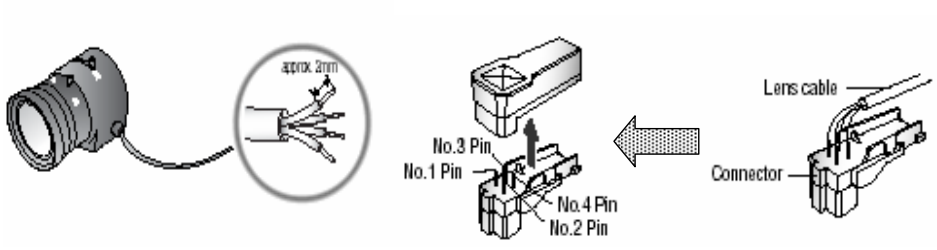
Power Input

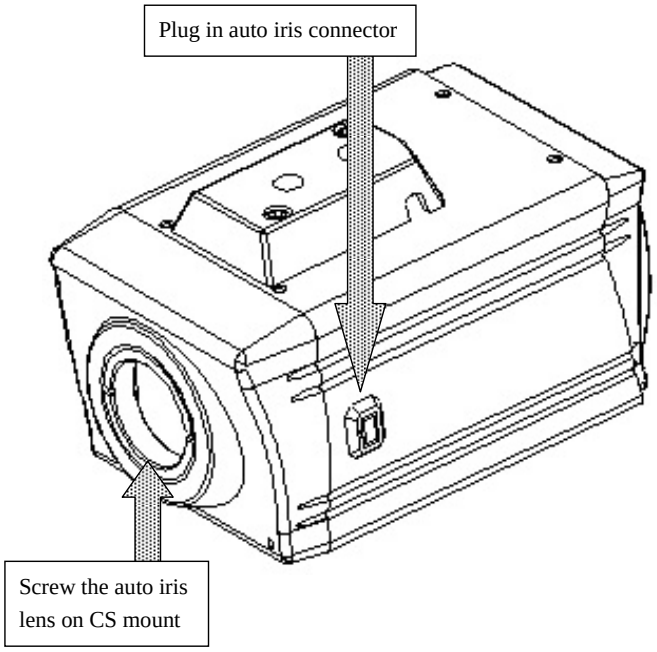
Analog Video Output

HD-SDI Output

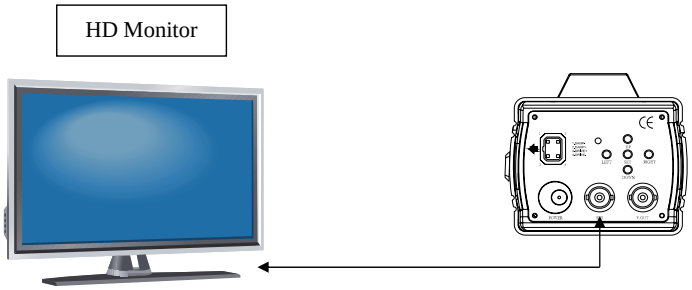
Auto Iris Function

	DC DRIVE	
Pin 1 (Red)	Drive	−
Pin 2 (N.C)	Drive	+
Pin 3 (White)	Damp	+
Pin 4 (Black)	Damp	−





Installation Instructions



(1) Remove the cap from the lens mount.

(2) Select the C mount lens (with mount ring) or CS mount lens.

(3) Screw and fasten the lens into the lens mount.

(4) Connect the HD-SDI output to the HD monitor with 75ohm type coaxial cable.

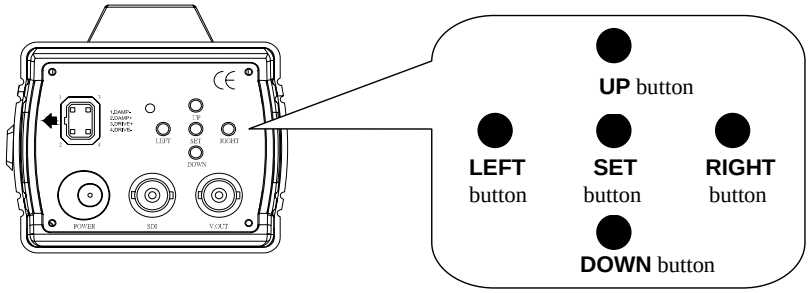
(5) Connect the power cord input.

(6) When monitor shows the picture, please adjust the focus and iris of the lens to obtain the best image according to the following procedures:

- Choose objects at a distance about 5 ~ 10 meter away.
- Loosen the mount lens fixing screw (use hex screwdriver), if necessary.
- Turn the lens and the mount together until image is clear.
- Screw the mount to camera.

(7) Fix camera to the bracket, if necessary.

Switch Definition



SET button

Press to display the menu. In the menu, this button functions as “ENTER”.

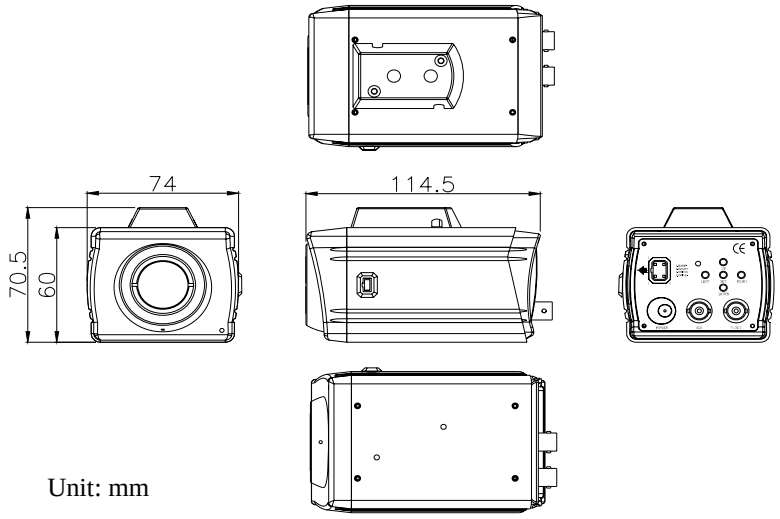
UP & DOWN buttons

Press to select the item of menu.

LEFT & RIGHT buttons

Press to change the item value.

Size Dimension

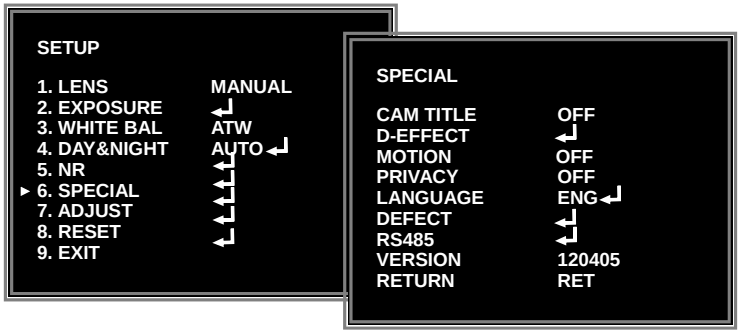


Unit: mm

Menu Operation

- Press the SET button to display the menu on screen.
- Press the UP or DOWN button to select the item.
- Press the LEFT or RIGHT button to change mode.
- The ENTER symbol ↵ means there is a sub-menu. Press the SET button to enter to the sub-menu.
- Select the EXIT item and press the SET button to finish setting.

1. **LENS**
2. **EXPOSURE**
3. **WHITE BAL**
4. **DAY&NIGHT**
5. **NR**
6. **SPECAIL**
7. **ADJUST**
8. **RESET**
9. **EXIT**



1. LENS

To select the lens mode depending on the lens used:

- **MANUAL** When manual iris lens is used.
- DC↵ When auto iris lens that requires a DC drive signal is used. Select MODE between **INDOOR**; OUTDOOR.

2. EXPOSURE

➢ **SHUTTER**

To change the shutter setting and speed based on the environment.

- AUTO After an immobile brightness value is set, the shutter speed will adjust automatically to achieve the value.
- FLK Select when flickering occurs on the screen due to an Imbalance between illumination and frequency. Under this mode, the shutter speed is NTSC: 1/100; PAL: 1/120.
- Fixed Speed adjustable: **1/30**; 1/60; 1/250; 1/500; 1/1000; 1/2000; 1/5000; 1/10000; 1/50000; X2; X4; X6; X8; X10; X15; X20; X25; X30

➢ **AGC (Auto Gain Control)**

Use this function to heighten the brightness signal automatically.

- **HIGH** LOW; MIDDLE adjustable.

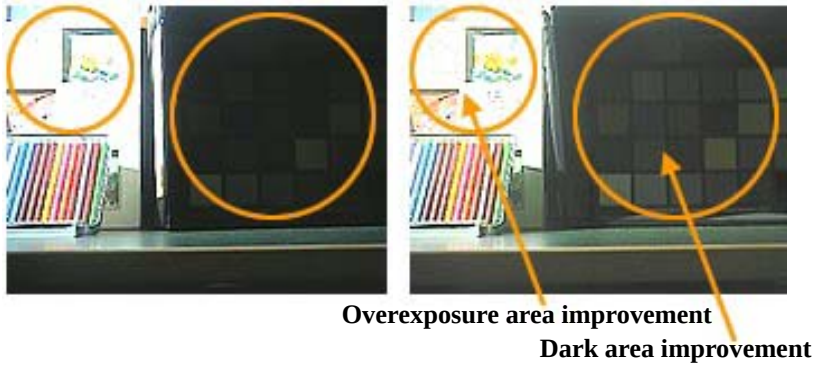
➢ **SENS-UP (Sensitivity Up)**
Makes objects visible in low luminance. To enable this function adjust the SHUTTER to AUTO.
- AUTO **X2**; X4; X6; X8; X10; X15; X20; X25; X30 adjustable
- **OFF** To disable this function.

SENS-UP: OFF **SENS-UP: X30**

➢ **BRIGHTNESS** Value 0~100 adjustable.

➢ **ACCE (Adaptive Color & Contrast Enhancement, D-WDR)**
When there is a very strong backlight behind the object, more than the BLC function can handle, enable this function to achieve a clear image of the background as well as the object.
- HIGH LOW; MIDDLE adjustable.
- **OFF** To disable this function.

ACCE: OFF **ACCE: HIGH**



➢ **DEFOG**
Automatically enhances the contrast to achieve high quality images in poor visibility conditions such as fog, rain and snow.
- HIGH LOW; MIDDLE adjustable.
- **OFF** To disable this function.

DEFOG: OFF **DEFOG: HIGH**

➢ **BACKLIGHT**
When there is strong backlight behind the object, enable this function to achieve a clear image of the background as well as the object.
- BLC Back Light Compensation
  -- GAIN: LOW; **MIDDLE**; HIGH selectable.
  -- AREA: Adjustable.
- HSBLC Highlight Supression BLC
  -- SELECT: AREA1~AREA4 selectable.
  -- DISPLAY: **ON**; OFF adjustable.
  -- LEVEL: 0~100 adjustable.
  -- MODE: **ALL DAY**; NIGHT adjustable.
  -- BLACK MASK: **ON**; OFF adjustable.
- **OFF** To disable this function.

HSBLC: OFF **HSBLC: ON**

3. WHITE BAL (White Balance)
- **ATW** Auto Tracking White Balance. The white balance will adjust continually according to the color temperature of the object.
- AWC→SET Auto White Balance Control. Push to set white balance according to the color temperature of the background.
- INDOOR Chose this mode for quick adjustment.
- OUTDOOR Chose this mode for quick adjustment.
- MANUAL The manual adjustment mode enables finer adjustment of ATW. Set the color temperature to MANUAL and then increase or decrease the BLUE (0~100) and RED (0~100) color values while monitoring the color changes on the object.

4. DAY&NIGHT

- **AUTO** Automatically changes between color mode under bright light environment and B/W mode under low light environment. Set the value of DELAY: 0~100; D-N (AGC): Day to Night 0~100; N-D (AGC): Night to Day 0~100; to define the changing condition and time.
- COLOR Common mode.
- B/W Stay in B/W mode for clear and better visibility image under low light environment. BURST: **ON**; OFF; IR SMART: **ON** (LEVEL selectable; AREA adjustable); OFF; IR LED: ON; **OFF**; IR PWM: Pulse-Width Modulation 0~100 adjustable.
- EXT Control day & night mode by external device, if connected.

5. NR (Noise Reduction)

Enable this function to reduce the noise at low light environment. This function enables the camera to use a higher AGC level to electronically enhance the sensitivity of the camera in low light environment (higher AGC, more noise).

- 2DNR ON; **OFF**
- 3DNR **ON (**S-LEVEL and E-LEVEL adjustable); OFF
- LEVEL 0~100 adjustable.
- SMART NR ON; **OFF**

2DNR: OFF **2DNR: ON**

6. SPECIAL

➢ **CAM TITLE (Camera Title)**

- ON To name the camera title.
- **OFF** Not active.

➢ **D-EFFECT (Digital Effect)**

- FREEZE -- ON: Freeze the picture image.
  -- **OFF**: To disable this function.

- MIRROR For applications such as rear view camera, you can rotate the image horizontally and vertically.
  -- MIRROR: To see mirror image on monitor screen.
  -- V-FLIP: To flip the image up side down.
  -- ROTATE: To rotate the image.
  -- **OFF**: To disable this function.
- D-ZOOM -- PIP: ON; OFF
  -- D-ZOOM: X2.0~X64 adjustable
  -- PAN&TILT
  -- **OFF**: To disable this function.
- NEG. IMAGE Negative Image
  -- ON: To show negative image on monitor screen.
  -- **OFF**: To disable this function.

MIRROR: OFF **MIRROR**

➢ **MOTION (Motion Detection)**

When the object on screen is moving, the camera will detect the changes.

- **OFF** To disable this function.
- ON -- SELECT: Select AREA1~AREA4.
  -- DISPLAY: **ON** (Adjust the position and size of the selected area); OFF
  -- SENSITIVITY: 0~60 adjustable.
  -- MOTION VIEW: **ON (**To display a warning on screen); OFF

➢ **PRIVACY (Privacy Zone)**

Cover the areas you do not wish to appear on screen.

- ON -- AREA1: Up to AREA7 selectable.
  -- DISPLAY: **ON** (Adjust the position and size of the selected area); OFF
  -- COLOR: 0~16 selectable.
- **OFF** To disable this function.

- **LANGUAGE**
  Supports **ENG** (English), JPN (Japanese), CHN1 (T. Chinese); CHN2 (S. Chinese).

- **DEFECT**
  - LIVE DPC Live Dead Pixel Correction.
    -- ON (LEVEL 0~60 adjustable); AUTO; **OFF**
  - STATIC DPC Static Dead Pixel Correction.
    -- **ON** (START and LEVEL 0~60 adjustable); OFF
  - SENS-UP X2; X4; X6; **X8**; X10; X15; X20; X25; X30 adjustable.

- **RS485**
  Not available.

- **VERSION**
  To show the version of this camera.

7. ADJUST

- SHARPNESS **ON** (LEVEL 0~100); RESOLUTION (**ON**; OFF); OFF
- MONITOR -- LCD: GAMMA: AUTO; **USER1**; USER2; 0.45~1.00 adjustable; BLUE / RED GAIN: 0~100 adjustable.
  --CRT: BLACK LEVEL: -30~+30 adjustable; BLUE / RED GAIN: 0~100 adjustable.
- OSD -- TEXT COLOR: 1~8 adjustable.
  -- OUTLINE: **ON**; OFF.
- LSC Lens Shading Compensation **ON**; OFF
- NTSC/PAL NTSC and PAL selectable.

LSC: OFF **LSC: ON**

8. RESET
To reset all functions to factory default settings.

9. EXIT
To exit the OSD menu.

Specification

MODEL	XCH17WM
IR OPTICAL FILTER	Built-in anti-aliasing IR-pass (850nm) filter
OLPF	Mechanical ICR (True Day & Night)
PICK-UP DEVICE	SONY 1/2.8” 2.0 Mega Pixel Progressive Exmor CMOS image sensor.
EFFECTIVE PICTURE ELEMENTS (H*V)	1920*1080
RESOLUTION	Full HD 1920*1080p @ 30fps
MIN. ILLUMINATION	Color: 0.1Lux / F1.2; B/W: 0.01Lux / F1.2; Sens-up: 0.001Lux / F1.2
S/N RATIO	More than 52 dB
POWER SUPPLY	DC12V / 500mA
CONTROL	O.S.D. (On Screen Display)
LENS MOUNT	C / CS Mount
AUTO IRIS	DC Drive Auto Iris Lens
VIDEO OUTPUT	1 x 1.0 Vp-p Composite Video / 75 ohm, BNC connector 1 x HD-SDI & SVBS / 75 ohm, BNC connector
OPERATING TEMP.	-10°C~50°C (14°F~122°F)

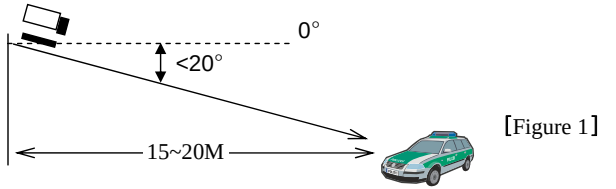
MENU OPERATION

1. LENS: **MANUAL** – DC (MODE: **INDOOR**; OUTDOOR)
2. EXPOSURE:
   - SHUTTER: AUTO – **1/30** – 1/60 – FLK – 1/250 – 1/500 – 1/1000 – 1/2000 – 1/5000 – 1/10000 – 1/50000 – X2 – X4 – X6 – X8 – X10 – X15 – X20 – X25 – X30
   - AGC: LOW – MIDDLE – **HIGH**
   - SENS-UP: **OFF** – AUTO: **X2** – X4 – X6 – X8 – X10 – X15 – X20 – X25 – X30
   - BRIGHTNESS: 0~100
   - ACCE: **OFF** – LOW – MIDDLE – HIGH
   - DEFOG: **OFF** -- LOW – MIDDLE – HIGH
   - BACKLIGHT: OFF – BLC (GAIN: LOW – **MIDDLE** – HIGH; AREA) – HSBLC (SELECT: AREA1~AREA4; DISPLAY: **ON** – OFF; LEVEL: 0~100; MODE: **ALL DAY** – NIGHT; BLACK MASK: **ON** – OFF)
3. WHITE BAL.: **ATW** – AWC→SET – INDOOR – OUTDOOR – MANUAL (RED: 0~100; BLUE:0~100)
4. DAY&NIGHT: **AUTO** (DELAY: 0~100; D>N(AGC): 0~100; N>D(AGC): 0~100) – COLOR – B/W (BURST: **ON** – OFF; IR SMART: **ON** – OFF; IR LED: ON – **OFF**; IR PWM: 0~100) – EXT
5. NR: 2DNR (ON; **OFF**) – 3DNR (**ON**: S-LEVEL: 0~100 – E-LEVEL: 0~100; OFF) – LEVEL (0~100) – SMART NR (ON; **OFF**)
6. SPECIAL:
   - CAM TITLE: ON – **OFF**
   - D-EFFECT: FREEZE (ON; **OFF**) – MIRROR (MIRROR; V-FLIP; ROTATE; **OFF**) – D-ZOOM (PIP: ON – OFF; D-ZOOM: X2.0~X64; PAN & TILT; **OFF**) – NEG.IMAGE (ON; **OFF**)
   - MOTION: ON (SELECT: AREA1~AREA4; DISPLAY: **ON** – OFF; SENSITIVITY: 0~60; MOTION VIEW: **ON** – OFF) – **OFF**
   - PRIVACY: ON (SELECT: AREA1~AREA7; DISPLAY: **ON** – OFF; COLOR: 1~6) – **OFF**
   - LANGUAGE: **ENG** – JPN – CHN1 – CHN2
   - DEFECT: LIVE DPC (ON: LEVEL: 0~60; **OFF**; AUTO) – STATIC DPC (**ON**: START – LEVEL: 0~60; OFF) – SENS-UP (X2; X4; X6; **X8**; X10; X15; X20; X25; X30)
   - RS485
   - VERSION
7. ADJUST:
   - SHARPNESS: SHARPNESS (**ON**; OFF) – LEVEL (0~100) – RESOLUTION (**ON**; OFF)
   - MONITOR: LCD (GAMMA: AUTO – **USER1** – USER2 – 0.45 – 0.50 – 0.60 – 0.65 – 0.70 – 0.75 – 0.80 – 0.85 – 0.90 – 0.95 – 1.00; BLUE GAIN: 0~100; RED GAIN: 0~100) – CRT (BLACK LIVEL: -30~+30; BLUE GAIN: 0~100; RED GAIN: 0~100)
   - OSD: TEXT COLOR (1~8) – OUTLINE (**ON** – OFF)
   - LSC: **ON** – OFF
   - NTSC/PAL: **NTSC** – PAL
8. RESET: FACTORY RESET
9. EXIT

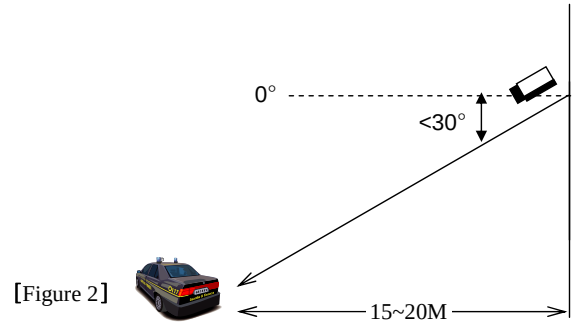
Appendix

Installation Manual for Special Application: License Plate Recognition

1. 4X or more Mega Pixel vari-focal auto iris lens is recommended. Connect regulated DC12V power supply to the power input at the rear panel of camera. Connect HD-SDI output to the HD monitor.
2. Fix the camera on the bracket. Adjust the viewing angle of camera according to the below recommendations:
   - **For capturing the front plate no.:** Setting the camera at a 15° or less vertical angle will achieve the best performance. Do not let the vertical angle exceed 20° (Figure 1).me
   - **For capturing the back plate no.:** The vertical angle must not exceed 30° (Figure 2).
   - **Capture zone distance:** Between 15~20 meters from the camera.



[Figure 1]



[Figure 2]

3. Adjust the zoom of the vari-focal lens. The picture width should not exceed 1.5 traffic lanes at the capture zone.
   → Enter SETUP menu and select “DC” under LENS options.

4. In order to ensure a clear image under different light conditions, adjust the settings once during the daytime and once during the nighttime is recommended to achieve optimal results.

   - **Daytime setting:**
     Adjust the lens focus to see a clear image both at the center and the upper / down edges of the monitor. If the image on the monitor is too bright, adjust the shutter speed accordingly.
     → Enter EXPOSURE sub-menu under SETUP menu and select “SHUTTER”.
     → Select shutter speed according to the speed of vehicle.

   - **Suggested Shutter Speed:**
     - When speed of vehicle is less than 50km: 1/250 sec.
     - When speed of vehicle is less than 100km: 1/500 sec.
     - When speed of vehicle is more than 100km: 1/2000 sec.

   - **Nighttime setting:**
     Adjust the lens focus to see a clear image at the upper / down edges of the monitor (means focus at the center). According to the environment, adjust AGC value to heighten the brightness signal when necessary.
     → Enter EXPOSURE sub-menu under SETUP menu and select “AGC”.
     → AGC: LOW – MIDDLE – HIGH adjustable.

5. If the image is smeared and the license plate number is not captured clearly, adjust the shutter speed until the image is clear.